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The Hard Clam Fishery Problems and Approaches

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The hard clam, Mercenaria mercenaria (Linne, 1758), is a euryhaline bivalve found along the eastern and Gulf coasts of North America (Abbott 1954; Carriker, 1961; Wass, 1972, Miller et al., 1975). It is an important commercial bivalve along the Atlantic Coast (Belding, 1912; Tiller et al., 1952; Andrews, 1970; Castagna and Haven, 1972; McHugh, 1972, 1977, 1982; Miller et al., 1975). Hard clams are consumed in a wide variety of ways, with the larger clams (>80 mm) being used in chowder and the smaller and more succulent littlenecks (<60 mm) ("necks") and cherrystones (61-80 mm) ("cherries") being eaten either steamed or raw on the half shell.

The fishery for hard clams in the Chesapeake Bay is presently only understood on a broad scale. Concentrated in the lower Chesapeake Bay and the seaside lagoons of the Eastern Shore, annual landings of hard clams in Virginia have decreased from a high of 2.4 million pounds of meats in 1965 to a low of 0.4 million pounds in 1978. The landings for 1979-1981 show only a slight upward trend. Maryland annual landings of hard clams peaked at 794,000 pounds of meats in 1969 and reached a low of 19,700 pounds in 1979. Total landings and number of permits are the only catch and effort data collected for the fishery. Therefore any analysis using catch per unit effort as a measure of abundance is not possible. Haven et al. (1973) computed catch per unit effort for the Virginia fishery using commercial data. Effort was measured in number of licenses and catch per unit effort in pounds per license. This did produce a curve similar in shape to the Schaefer logistic function (Schaefer, 1954), but is difficult to interpret because the nominal unit of effort used in this analysis (number of licenses) is far removed from real fishing effort. Measures of real fishing effort for patent tong harvesters ideally should be expressed in hours fished/day, but it is unrealistic to believe this

effort data could be collected. A unit of real fishing effort expressed in boat-days could realistically be collected and would provide a measure of catch/boat/day, a more accurate estimate of catch per unit effort than pounds/license.

Patent tongs are the primary harvesting gear used on the Western Shore of the Bay. The majority of the Western Shore clammers participate in the summer James River fishery and then return to Poquoson Flats, Mobjack Bay, or the York River during the remainder of the season. There are no accurate means of determining the catch/boat/day from the information presently collected. Average catch/boat/day for each of these areas may or may not be declining, but there is no way at present to ascertain this.

On the Eastern Shore, accurate determination of catch is also difficult. Recreational harvesting by signing and clam rakes is extensive (Castagna and Haven, 1972) and does not facilitate accurate estimation of catch. Signing is a method of harvesting in which clams are located on the bottom by the use of a person's feet, and then removed by a clam pick. Effort determination in the recreational fishery is difficult at best. The recreational fishery is exempt from licensing laws because they harvest only for household use (Virginia Code §§ 28.1-120(8)). Thus, this portion of the harvest is excluded from reported landings.

Data collected for the Virginia clam fishery is obtained from surveying buyers. The resulting statistics give gross characteristics of the fishery, but do not represent 100% of the landings and do not reflect fishing effort. Total landings may increase or decrease, but this may be a reflection of increased or decreased effort. Less than one hundred percent of the landings is reported because contact cannot be made with every buyer. The only area where 100% of the landings are reported is in the James River. This is due to mandatory reporting of polluted clams harvested in this fishery. All boats unload their catch at one location, making data collection relatively easy (Kvaternik, in prep.).

While recognizing today's current trends towards deregulation of business, the only other accurate alternative to the present system of data collection is one that relies more heavily on contribution of the seafood industry, and the clam buyer in particular. Buyers could provide the elusive catch/boat/day figure that could give some indication of stock size and recruitment in heavily fished

areas. Furthermore, a breakdown of the clam catch into its three market sizes (littlenecks, cherrystones, and chowders) is also needed. This could provide a monitor of recruitment success, albeit crude. The lack of such data presents a problem when trying to conduct any economic analysis because of the varying ex-vessel prices assigned to each of the three grades (Kvaternik and DuPaul, in prep.) (Table 1). Littleneck and cherrystone clams bring a much higher ex-vessel price than chowders. However, this cannot be discerned from the published statistics (Virginia Marine Resources Commission, 1981). The disaggregation of the landings data into grades would allow more accurate economic analyses of ex-vessel price fluctuations in response to changes in supply (Personal communication, Oral Capps, Jr., Dept. of Agricult. Economics, VPI and SU, Blacksburg, Virginia, 16 June 1982).

An additional point must be made regarding underreporting of catch, which is a problem common to most commercial fisheries. Published statistics report the catch during one three month period in the James River to be 30,000 pounds less than the actual harvest (Table 1). The amount of underreporting for the entire year in this fishery can only be estimated at 30-35%. Similar arguments can be made for other species which bring different ex-vessel prices depending on product grade and quality. Underreporting may become a critical factor if revenue sharing measures now before Congress allocate funds to states based on reported commercial fisheries landings and values. States must act now to collect accurate landings information.

Another possible method of catch estimation is through the use of a random sample survey of clammers (similar to the Maryland method of estimating blue crab catch). This methodology has not been applied to any of the Virginia fisheries but should work if the sampling strategy is designed to reach a representative sample of the harvesters. This would provide an estimation of total catch and proportion of each grade. This would require much greater automated data processing facilities than exist at present. Either of these two methods will require a greater commitment via financial resources or legislation from the General Assembly.

The hard clam fishery is small when compared to other Virginia fisheries but the problems that exist in the collection of catch statistics are common to all fisheries. The situation of incomplete fisheries statistics is one which

TABLE 1. COMPARISION OF ACTUAL LANDINGS WITH PUBLISHED STATISTICS FOR HARD CLAMS IN THE JAMES RIVER, MAY THROUGH AUGUST 1981

	Clams	#/bu.	bu.	Pounds of Meats (bu. X 8)	Percent of Total Landings	Ex-vessel Value (dollars)	Price per Pound (dollars)
Necks	8,573,431	500	17,147	137,175	69.32	428,672	$3.1250
Cherries	2,245,213	300	7,484	59,872	30.26	112,261	$1.8750
Chowders	18,169	175	104	831	0.42	546	$0.6562
Totals	10,836,833		24,735	197,878	100.00	541,479	

Virginia Marine Resources Commission published statistics - May through August 1981

Pounds of Meats	Ex-vessel Value	Price Per Pound (dollars)
164,528	442,524	$2.6896

Weighted price per pound unit (calculated from actual landings) = $2.7364

can be remedied by a definite commitment from the state, followed by an appropriation of resources to carry out the task. Only through this renewed commitment can we get the broad indication of stock size and recruitment needed to make intelligent decisions regarding management of the fishery.

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